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"Insulin +" Therapy Education Programme

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Abstract

Given the high prevalence of diabetes mellitus, implementing "Insulin +" Therapy Education Programme stems from the need to improve knowledge and build skills in people with type 1 diabetes. This paper is based on this need. The study was conducted with a non-random sample, in which 30 people with type 1 diabetes were invited to participate. They were selected from among all of the patients who attended the Diabetes Unit of a regional hospital centre in central Portugal. After the "Insulin +" Therapy Education Programme intervention there was an improvement in the subjects' knowledge, particularly in self-monitoring (ideal glycaemia value, hand-washing, glycaemia testing and disinfection of the testing location) and insulin therapy (maintenance, technique and administration location, prevention of hyperglycaemia and hypoglycaemia).

The programme can be applied as a measure of therapeutic education and evaluation and auditing of good clinical practice.

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Keywords: Insulin +; Therapy Education Programme

1. Introduction

In 2012, the International Diabetes Federation (IDF) revealed that over 371 million people around the world live with diabetes. According to this authority, the number of people with diabetes in 2012 (aged between 20 and 79 years) in Portugal was 1 031 000 people (594 000 and 437 000 males and females respectively). The IDF also notes that diabetes was responsible for 4.8 million deaths (7890 in Portugal) last year and is the leading cause of blindness, kidney failure, heart attack, cerebrovascular accident (CVA) and amputation. Compounding the situation many people are not even aware they suffer from diabetes and so do not take measures exercising self-control. Nationally, the number of people in these circumstances will have been 428 850 in 2012 (IDF, 2012).

People with diabetes are responsible for 95% of spending on caring for themselves, which is usually applied without qualifications and the adequate knowledge (IDF, 2009). Access to diabetes education is an essential factor in addressing this challenge.

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Type 1diabetes is a chronic disease that affects people for the rest of their lives in that they will need to adopt daily measures of self-control. People with diabetes thus require multiple insulin injections, manage carbohydrate counts, an appropriate physical exercise plan and self-control skills for their day-to-day well-being with fewer unpleasant symptoms and to be as healthy as possible. Insulin treatment is critical since there is a deficit of this hormone in the person with diabetes, (Hanas, 2007).

The International Council of Nurses (2010) proposes the Chronic Care Model (CCM) as a benchmark for the intervention. Diabetes fits within the framework of this model whose approach is centred on the interaction between a participating patient, who is motivated, informed, with the skills and confidence necessary to make effective decisions about their health and its management, and a proactive professional, who is motivated to inform patients, support their decisions and has the resources to provide quality care. Among the six interrelated elements upon which the model is based, the "patient care provider relationship" stands out within the conceptual framework of self-care. As for activities/contributions, involvement of active partners in managing the respective disease(s) and facilitating the patient's self-care and management are highlighted.

Traditionally, there are three key elements in controlling diabetes (Hanas, 2007): insulin, nutrition plan and physical exercise. This program focuses on insulin (type, conservation, and subcutaneous injection), self-monitoring, and aspects of self-control (hypoglycaemia, hyperglycaemia, ketoacidosis, glycosylated haemoglobin and anthropometric measurements).

2. Problem Statement

Because managing any chronic disease requires the participation of patients, it is necessary to monitor its impact, particularly in psychosocial functioning and behaviour. Thus, all efforts must be made to collaborate in determining the health gains obtained from the treatments and from the perspective of the citizen (Ferreira 2012).

Silva et al. (2011) sustains that self-management education programmes seek to help people to become aware that they are their own primary caregivers and health professionals are consultants who support them in this role. The intervention programme implemented yielded positive results, including in individuals' behaviour in the treatment of their disease. Melo et al. (2011) argue that nurses must fulfil the role of educator, of promoting support groups, in addition to the necessary guidelines regarding the glycaemia testing. Nurses should also emphasize the importance of adhering to healthier habits, negotiate the care plan with the patient and plan specific interventions. Thus, it is important to identify action strategies developed in order to improve service to patients with diabetes so as to achieve results in health gains. The scope of these results should also be identified as well as the contexts from which they emerge. It also seems important to know the composition of the teams involved in the programmes identified, in order have a more concrete understanding of their operationalization. On the one hand, we have evidence about the complications of diabetes that significantly reduce quality and duration of life and which are responsible for huge healthcare costs. On the other hand, a large body of evidence which has demonstrated the existence of effective approaches and practices that can substantially reduce this burden has been identified. Nevertheless, a marked variability in preventive and therapeutic approaches has been documented, suggesting that health care directed to the patient with diabetes may not produce the desired gains associated with health (Menino, 2013). This study emerged against that background. Its main objective was to evaluate the implementation of an intervention programme for people with type 1 diabetes.

3. Research Question

The research question raised in this study was:

- Does "Insulin +" Therapeutic Intervention Education Programme influence metabolic control in people with diabetes?

4. Purpose of the Study

The aim of the project was to implement the "Insulin+" Therapeutic Education Programme, an essential education tool for

people with type 1 diabetes. Its objectives are to characterize the level of knowledge of people with type 1 diabetes have, as well as classify their metabolic state. It was further intended to determine the effectiveness of the programme in building skills and techniques for people with type 1 diabetes and estimate its effectiveness in improving these people's metabolic states.

5. Research Methods

The quasi-experimental study (before and after implementing the programme) includes descriptive data analysis. Participants are people with type 1 diabetes among the population of 216 patients attending the Diabetes Unit consultation at a regional hospital centre in central Portugal. To develop this project, a sample of 30 individuals with type 1 diabetes was selected. The participants in the sample were informed of the existence and development of the programme and invited to participate. The selected sample was made up 13 men (43.3%) and 17 women (56.7%), aged 19 to 48. The sample was divided into three groups of 10 participants; each group participated in 4 sessions of health education on "Insulin".

Information was collected based on the Clinical Information Form, the Knowledge Questionnaire and the Observation Grid (Teixeira, Cunha & Dias, 2013). The Clinical Information Form comprised questions on how long the diabetes had been diagnosed, weight, height, BMI, neck circumference, waist circumference, number of tests per day, number of hypoglycaemic episodes in the past three weeks, number of hyperglycaemic episodes in the past 3 weeks, HbA1c value and type of insulin administered. The Knowledge Questionnaire included questions to assess participants' knowledge about self-monitoring, insulin, hypoglycaemia and hyperglycaemia. And the Observation Grid allowed data on the following to be recorded: correct technique of insulin administration, correctly identifying where to administer insulin and adopting a rotation scheme where insulin is administered.

Data collection for the Diabetes Unit patients was authorized by the Administration Council of the Tondela Viseu Hospital Centre (CHTV) in Portugal.

6. Findings

Generally speaking, it appears that there are no meaningful changes in indicators regarding clinical information. It is worth emphasizing that in implementing the programme there was a slight decrease in the population's weight, BMI, and perimeter of the neck circumference (cm). The exception is the number of hyperglycaemic episodes in the previous three weeks, which increased by approximately 36% after the programme. According to the clinical team, this happened due to the season the "Insulin+" Therapeutic Education Programme was implemented, the participants' holiday period.

The data will be now analysed in detail. First, let us consider data obtained prior to the programme, where participants were observed in their usual consultations and then, after the programme, the aim of which, was to foster knowledge transfer to the individuals.

As for the classification of nutritional status and metabolic risk, with regards to neck circumference, the overall average for both females and males was approximately 36.1 cm. The results for females before and after the study were 34.2 cm and 33.8 cm, respectively, and for males 38.9 cm and 39.1 cm respectively. Therefore, there was a decrease in neck circumference in females and an increase in males. These variations are explained by the decrease in weight in females and an increase in males. Consequently, if we compare these values with the reference for abdominal obesity, we find that the females are below the reference and the males are above it. Let us recall that regarding the neck circumference Onat *et al* (2009) defines 38.5 cm for men and 34.5 cm for women. With respect to metabolic risk associated with waist circumference, the results show an increase of 13.3 cm, compared to the initial state. Note that for greatly increased risk, there was a significant improvement – from 40% to 36.7%.

Regarding nutritional status, two trends are clearly shown. After the programme, females with "normal weight" decreased

their weight by 6%. In addition to this reduction, the first underweight individual appears (approximately 6%). An inverse trend was observed in males with one individual gaining weight and moving from "underweight" to "normal weight". There was also an increase in the number of pre-obese females from 3 (17.6%) to 4 (23.5%) women after the programme. Overall the number of individuals with normal weight increases (from 17 to 18) as well as the number of pre-obese individuals (from 6 to 7). With regards to obesity, it is worth highlighting the existence of only class I and II obesity, with only the former type in females. The programme allowed positive results to be obtained as there was an overall reduction in the number of obese individuals (2).

Regarding the normal value of glycaemia, the results obtained after of the programme are very promising. The following increases were obtained: 30% (9 individuals), 36.7% (11 individuals) and 33.4% (10 individuals).

Moreover, the individuals also increased their concerns so as to value glycaemia testing further after training. Indeed, individuals no longer only performed their glycaemia testing once a day. It is worth noting that the number of individuals who performed their glycaemia testing one to five times a day increased by 13.3%. Only one individual did not perform glycaemia testing before or after the programme. After the programme, the number of hyperglycaemic events in the past three weeks, increased by approximately 36%, perhaps due to the season it was implemented: during participants' holidays.

Table 1 – Programme Implementation

When assesment takes place / Given Parameters	Before the programme							After the programme						
	x	Min	Max	S	CV (%)	SK	K	x	Min.	Max	S	CV (%)	SK	K
How long diabetes has been diagnosed	15	1	38	103	68.6	0.529	-0.8	15.0	1.0	38.0	10.3	68.6	0.5	-0.8
Weight (Kg)	68.6	46.2	110.8	15.0	21.84	1.1	1.0	68.5	46.5	110.2	14.6	21.37	1.1	1.0
Height (cm)	165.4	150.0	181.0	7.2	4.4	0.3	-0.1	165.4	150.0	181.0	7.2	4.38	0.3	-0.1
BMI	25.1	18.3	38.3	5.0	19.91	1.0	0.6	25.0	16.2	38.1	4.9	19.56	0.9	0.7
Waist circumference (cm)	88.2	68.5	125.0	13.5	15.25	0.8	0.4	88.7	68.5	125.0	13.1	14.71	0.9	0.6
Neck circumference (cm)	36.3	30.0	52.6	4.7	12.99	1.6	3.7	36.1	29.5	51.8	4.6	12.63	1.5	3.6
Number glycaemic tests per day	4.6	0.0	8.0	1.6	34.13	-0.4	1.9	4.3	0.0	8.0	1.5	33.95	-0.1	2.4
Number of hypoglycaemic episodes in the last 3 weeks	5.5	0.0	22.0	6.1	110.5	1.9	3.2	5.5	0.0	22.0	7.0	127.1	1.5	1.2
Number of hyperglycaemic episodes in the last 3 weeks	7.9	0.0	21.0	0.6	7.1	0.6	0.2	10.8	0.0	26.0	10.0	92.43	0.7	-1.2
Metabolic control: glycosylated haemoglobin	9.0	6.2	14.2	1.8	19.93	1.4	2.2	8.9	6.2	14.1	1.7	18.94	1.5	2.8
Days										57.0	2.6	4.74	-0.4	-1.6

7. Conclusion

The study results shows that, generally speaking, after the intervention there are no significant changes in the data with regards to clinical information. Note that, by implementing the programme there was a slight decrease in weight, BMI and neck circumference (cm). This was not found in the number of hyperglycaemic events in the last 3 weeks under study, given that there was an increase of about 36%.

After the programme, 13.3% of the patients adopted alternative schemes in administering insulin. Eighty percent of patients already adopted an insulin administration scheme before the training intervention. Afterwards, this number increased to 96.7%

(29 users).

We may conclude that after the "Insulin +" Therapy Education Programme intervention, there was an improvement in the subjects' knowledge, particularly in self-monitoring (ideal value, hand-washing, glycaemia testing and disinfection of the testing area) and insulin therapy (maintenance, technique and areas of administration, hyperglycaemia and hypoglycaemia prevention). This programme could be inferred to be applied as a measure of therapeutic education and evaluation and auditing of good clinical practice.

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